Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
RURAL DIGITAL OPPORTUNITY FUND	)	WC Docket No. 19-126
CONNECT AMERICA FUND	)	WC Docket No. 10-90

COMMENTS OF
SPACE EXPLORATION TECHNOLOGIES CORP.

I. INTRODUCTION

Space Exploration Technologies Corp. ("SpaceX") hereby comments in response to the Notice of Proposed Rulemaking ("NPRM") proposing that the Commission establish a Rural Development Opportunity Fund.[1] As contemplated by the NPRM, the new fund would distribute $20.4 billion in two phases, each of which would support the deployment of broadband to unserved areas over a ten-year term.

This new fund gives the Commission an opportunity to review its previous subsidy programs, build on its successes and find places for improvement. But more importantly, this new fund will potentially distribute *ten times* as much money as the Commission allocated in its previous fund—the Connect America Fund Phase II auction—and over a timeframe that will extend into the 2030s. With the Commission poised to have a major influence on how the broadband market develops over the coming decade, it should carefully consider how to account for numerous burgeoning technologies, such as 5G mobile broadband, wireless Internet service

[1] *Rural Digital Opportunity Fund, Connect America Fund*, WC Docket Nos. 19-126 and 10-90 (rel. Aug. 2, 2019) ("NPRM"); *see* 84 Fed. Reg. 43543 (Aug. 21, 2019).

providers ("WISPs"), and non-geostationary orbit ("NGSO") satellites like those operated by SpaceX.

To maximize the benefit this fund can have on American consumers—especially those in rural areas—the Commission should encourage a broader range of potential providers to participate in the program and ensure efficient and effective distribution of funds by: (1) eliminating the standalone voice requirement, (2) clarifying how it intends to enforce compliance with its requirement that usage allowances match the U.S. average (if over 2 TB), and (3) considering whether it should distribute funds in multiple tranches, rather than conducting a one-time auction that could lock in technology choices for a decade.

II. BACKGROUND

SpaceX was founded in the United States in 2002 with the express goal of dramatically improving the reliability, safety, and affordability of space transportation. Today, SpaceX has grown to over 6,000 employees in headquarters, launch, and development facilities throughout the United States. SpaceX's Falcon family of launch vehicles regularly provides dependable and affordable launch services to NASA, the Department of Defense, and satellite manufacturers and operators from around the world.

SpaceX continues to build on its proven track record of technical and operational excellence. The Falcon 9 reusable launch vehicle has successfully flown 73 times, including flights of 26 flight-proven boosters. The Falcon Heavy is the most powerful operational rocket in the world, and has already flown three successful commercial missions. Since the start of 2017, SpaceX has completed more than twice as many missions as any other U.S. launch provider. Additionally, SpaceX developed the Dragon spacecraft, which conducts routine missions to the International Space Station in uncrewed and, soon, a crewed configuration that

will represent the first American astronauts launching into orbit on an American rocket since the Space Shuttle was retired in 2011.

SpaceX is now using its launch capacity and manufacturing efficiency to create, deploy and operate the Starlink network: a constellation consisting of almost 12,000 NGSO satellites when fully deployed, capable of providing broadband at competitive speeds and latencies anywhere on the planet. Starlink's low latencies—less than 30 milliseconds—are possible because the constellation will operate far closer to Earth than typical satellite broadband systems. A few months ago, SpaceX took a major step towards achieving the deployment of a commercially viable network by launching 60 Starlink satellites, and is planning more launches before the end of 2019. SpaceX plans to have coverage across the entire continental United States—and around the world—by the end of 2020.

While SpaceX did not pursue funding in the CAF II auction,[2] it recognizes the significant role high-cost support plays in the overall state of broadband deployment and competition. In light of these considerations, SpaceX makes the following proposals in the spirit of improving the proposed funding program to best serve consumers and account for developing technologies and the changing market landscape.

III. TO ENCOURAGE PARTICIPATION BY A WIDER VARIETY OF POTENTIAL PROVIDERS, THE COMMISSION SHOULD NOT REQUIRE A STANDALONE VOICE SERVICE THAT COULD DRIVE UP OVERALL COSTS TO CONSUMERS WITH LITTLE, IF ANY, CORRESPONDING BENEFIT

The Commission has historically required that recipients of Federal subsidies for broadband services offer a standalone voice service to ensure that consumers in remote areas are

[2] Letter from Patricia Cooper, SpaceX, to Marlene H. Dortch, FCC Secretary, AU Docket No. 17-182, WC Docket No. 10-90 (filed May 8, 2018).

able to make calls when necessary.[3] And while the Commission once again seeks comment on whether participants in the new fund "would be required to offer standalone voice service,"[4] developments in technology now mean that consumers would be better served without such a requirement. Given the relative development of broadband and voice services, and the overall impact of this new program, the time has come for the Commission to move past the dated requirement for a standalone voice service.

The standalone voice requirement is no longer useful for nearly all consumers, because Americans no longer choose to buy standalone voice. As the Commission recognized as long ago as the end of June 2016, its own data "clearly demonstrate [that] the number of switched access lines has 'continued to plummet,' while the 'number of interconnected VoIP and mobile voice subscriptions has continued to climb.'"[5] Remarkably, since that statement, the Commission's most recent data from the end of December 2017 show that switched access lines dropped another 19.8% in just 18 months, amounted to just 75% of interconnected VoIP subscriptions, and stood at a mere 10.9% of all retail voice telephone service lines.[6] These trends have no doubt continued.[7] When given the option, consumers do not choose standalone voice—consumers choose broadband and add a VoIP component.

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[3] *See* 47 C.F.R. §54.101; *Connect America Fund et al.,* Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17693 (2011) ("*USF/ICC Transformation Order"*), *aff'd sub nom., In re: FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014); *Connect America Fund et al.*, Report and Order, 28 FCC Rcd 15060, 15062 n.12 (2013); *Connect America Fund et al.*, Order, 32 FCC Rcd 968, 986 (2017).

[4] NRPM at ¶ 23.

[5] *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, Second Report and Order, 33 FCC Rcd 5660, 5673-74 (2018), quoting AT&T Wireline Comments, WC Docket No. 17-84 (filed Jun. 15,2017) at 41 (which in turn cites FCC, Wireline Competition Bur., Industry Analysis and Technology Div., *Voice Telephone Services: Status as of June 30, 2016* at 2 (2017)).

[6] FCC, Wireline Competition Bur., Industry Analysis and Technology Div., *Voice Telephone Services: Status as of December, 2017* at 2 (2019).

[7] Extrapolating from the FCC's most recent data by applying the average rates of decrease and increase, switched access lines would stand at just over 41,000,000 in June, 2019, 56% of the 73,000,000 interconnected VoIP subscriptions and 8.8% of all retail voice telephone service lines.

Given the current state of the market, whatever minimal benefits this government mandate could offer are far outweighed by the costs to consumers and businesses. Without this requirement, no sensible IP-based provider would deploy voice-specific hardware in their networks and possibly segregate capacity for a service consumers do not want. This requirement also adds costs to develop and make available voice equipment, and provide voice-specific customer support and tailored consumer offerings. All of these steps make it more difficult for new entrants to compete for high-cost support, without adding any functionality that the consumers will buy. Ultimately, the standalone voice requirement diverts resources competitive providers could better use expanding their networks. By eliminating this unnecessary burden and streamlining the program, the Commission will encourage more bidders, encourage recipients to use their resources efficiently, and lower cost for the end user.

To be clear, SpaceX does not object to the requirement that customers have access to voice telephony.[8] Ensuring that voice telephony is available over a broadband service does not, however, require the offering of an entirely separate standalone voice service to customers, and the law does not prevent the Commission from making the correct policy decision here. While provision of a voice service may be required under the Act, it can be done in combination with broadband.[9] And as the Commission has concluded, "voice service" does not mean a standalone switched access line, but instead means a "technologically neutral approach" allowing either "PSTN or IP networks" to provide "voice grade access to the public switched network or its functional equivalent."[10] Moreover, the Commission has, properly, already begun to deemphasize voice services in applying other types of universal service support, granting broad

[8] *See* 47 U.S.C. §254.
[9] Comments of SpaceX, AU Docket No. 17-182, WC Docket No. 10-90 (filed Sept. 18, 2017) at 7-8.
[10] *USF/ICC Transformation Order* at 17691-93. The Tenth Circuit specifically upheld this conclusion, rejecting an appeal by NTCA. *In re: FCC 11-161*, 753 F.3d at 1044-48.

forbearance to price cap carriers from the requirement to offer voice telephony throughout their service areas,[11] and phasing out support for voice services in the E-rate and Lifeline programs.[12] Concluding that voice-only service was no longer needed in the Lifeline program, the Commission noted that such service will still be available and affordable "if it is part of a bundle with broadband services."[13] This same reasoning extends equally to high-cost support.

SpaceX thus proposes that the Commission take this opportunity to bring the Rural Digital Opportunity Fund program up to date with the Lifeline and E-rate programs by eliminating the standalone voice requirement. Instead, the Commission should modernize the program and bring down costs for consumers by ensuring that IP-based voice applications are made available to their broadband consumers.

IV. TO MAXIMIZE PARTICIPATION, THE COMMISSION SHOULD PROVIDE CERTAINTY BY CLARIFYING HOW IT WILL ENFORCE USAGE ALLOWANCES

SpaceX recognizes that tiered support based on system performance can optimize distribution of funds and encourage deployment of better systems over time.[14] In fact, well-designed NGSO systems will be capable of exceeding the baseline speeds and latencies proposed by the Commission. With regard to these tiers, the Commission asked whether the Above Baseline and Gigabit tiers should have a usage allowance of 2 terabytes (TB) or the "average usage of a majority of fixed broadband customers, whichever is higher."[15] While SpaceX agrees

[11] *See Connect America Fund et al.*, Report and Order, 29 FCC Rcd 15644, 15663-71 (2014).
[12] *See Modernizing the E-Rate Program for Schools and Libraries,* Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8870, 8922-28 (2014); *Lifeline and Link Up Reform and Modernization et al.*, Third Report and Order, Further Report and Order and Order on Reconsideration, 31 FCC Rcd 3962, 3981-87 (2016) ("*Lifeline Modernization Order*").
[13] *Lifeline Modernization Order* at 3984.
[14] NPRM at ¶¶ 23-27.
[15] *Id.* at ¶ 23. This proposal is expressed in a summary table in the NPRM as "≥2 TB or U.S. median, whichever is higher." *Id.* at ¶ 25. "Median" and "average" are, however, two different things: a median is the midpoint of a set of values when the values are ranked in order, and the average is the sum of the set of values divided by the number of values. Thus, the Commission should clarify whether it means to take

that, over ten years, average U.S. usage will inevitably increase and high-cost recipients should keep pace, the Commission should consider how this requirement should be enforced, especially in light of the fact that forecasting accurate usage changes—much less the rate of those changes—over ten years is nearly impossible. The Commission could not have predicted today's usage patterns in 2009, and there is no reason to believe that, today, the Commission or the telecommunications industry can predict with certainty what demand or usage will be in 2030.

And getting this wrong in the context of high-cost support could have significant consequences for recipients and consumers. If the Commission were to withdraw funding suddenly from a recipient because it failed to keep pace with average usage, then that may compound the problem by halting network expansion and stranding customers at usage allowances lower than the U.S. average. Uncertainty over how the Commission might enforce the requirement may very well lead operators who might otherwise have bid to forego competing for support, rather than face unknown penalties for failing to keep pace.

Accordingly, the Commission should clarify how it intends to enforce this requirement, beyond the general statement in the rules that failure to comply can result in "further action," including "penalties, reductions in support amounts, potential revocation of ETC designation, and suspension or disbarment."[16] SpaceX suggests that the Commission require a technologically neutral method that ensures all support recipients can anticipate, engineer to and build to significant increases in usage. SpaceX proposes that, once average usage reaches a level at which it is expected to exceed 2 TB within one year, recipients have 6 months to report to the Commission their plans to meet U.S. average usage above 2 TB. The Commission should then

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the average or median usage of fixed broadband customers. For the purposes of these comments, SpaceX will assume the Commission means to use an average, as stated in the text of the proposal.

[16] 47 C.F.R. § 54.320(c).

provide a safe harbor from enforcement for two years after the U.S. average exceeds 2 TB to allow recipients to come into compliance with their plans. This would provide more than enough flexibility for all recipients to continue to improve service, but avoid causing a situation where some recipients may need to make emergency investments to increase usage at the cost of expanding the network.

V. TO ACCOUNT FOR THE RAPID CHANGES IN TECHNOLOGY AND THE MARKET, THE COMMISSION SHOULD PROVIDE FLEXIBILITY BY DISTRIBUTING FUNDS IN DIFFERENT TRANCHES OVER MULTIPLE YEARS

The Commission asks for comment on its proposed two-phase structure and budget, and on its proposal to include all eligible census blocks in each auction.[17] While the Commission is correct that distributing the funds over the course of ten years does help providers make long-term investments that might otherwise be uneconomic to serve with a shorter support term,[18] allocating all $20 billion may be too rigid to maximize the effectiveness of the fund. This new fund will be considerably larger than the CAF II auction, and so it is correspondingly more important that the Commission's process leads to efficient results. As such, the Commission should consider auctioning the funds in a sequence of tranches, with a ten-year term per auction. By doing so, the Commission could reassess the country's broadband needs in light of ongoing technological developments, increased availability of spectrum for terrestrial and satellite services, and the availability of more accurate location data over time. This approach would allow the Commission to prioritize areas of most need at a given time, minimize the harm of locking in decisions over a huge amount of support for ten years, and maximize efficiency by allowing market forces and better information to guide investment over time.

[17] NPRM at ¶¶ 16-18, 21-22.
[18] *Id.* at ¶ 15 (quoting *Connect America Fund et al.,* Report and Order, 29 FCC Rcd 7051, 7061-62 (2014), quoting *Tech Transitions et al.,* 29 FCC Rcd 1433, 1476-77 (2014).

VI. CONCLUSION

For the foregoing reasons, the Commission should (1) end the requirement that provision of a standalone voice service is required to bid in the auction or receive funding, (2) clarify that it intends to allow recipients of funding sufficient time to meet its proposed usage allowances as they increase, and (3) distribute funds in tranches to allow for periodic reassessment of broadband needs. By taking these actions, the Commission can increase participation in the Rural Development Opportunity Fund auction while providing flexibility to realign program priorities as necessary to reflect market developments.

Respectfully submitted,

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September 20, 2017